

PATENT COOPERATION TREATY

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INTERNATIONAL PRELIMINARY REPORT ON PATENTABILITY
(Chapter II of the Patent Cooperation Treaty)

(PCT Article 36 and Rule 70)

Applicant's or agent's file reference 303810WO/PRS/EB		FOR FURTHER ACTION See Form PCT/IPEA/416	
International application No. PCT/IB2004/004356	International filing date (day/month/year) 16-12-2004	Priority date (day/month/year) 19-12-2003	
International Patent Classification (IPC) or national classification and IPC See Supplemental Box			
Applicant Nokia Corporation et al			

1. This report is the international preliminary examination report, established by this International Preliminary Examining Authority under Article 35 and transmitted to the applicant according to Article 36.

2. This REPORT consists of a total of 8 sheets, including this cover sheet.

3. This report is also accompanied by ANNEXES, comprising:

a. ☒ (sent to the applicant and to the International Bureau) a total of 3 sheets, as follows:

☒ sheets of the description, claims and/or drawings which have been amended and are the basis of this report and/or sheets containing rectifications authorized by this Authority (see Rule 70.16 and Section 607 of the Administrative Instructions).

☐ sheets which supersede earlier sheets, but which this Authority considers contain an amendment that goes beyond the disclosure in the international application as filed, as indicated in item 4 of Box No. I and the Supplemental Box.

b. ☐ (sent to the International Bureau only) a total of _____, containing a sequence listing and/or tables related thereto, in electronic form only, as indicated in the Supplemental Box Relating to Sequence Listing (see Section 802 of the Administrative Instructions).

4. This report contains indications relating to the following items:

<input checked="" type="checkbox"/> Box No. I	Basis of the report
<input type="checkbox"/> Box No. II	Priority
<input type="checkbox"/> Box No. III	Non-establishment of opinion with regard to novelty, inventive step and industrial applicability
<input type="checkbox"/> Box No. IV	Lack of unity of invention
<input checked="" type="checkbox"/> Box No. V	Reasoned statement under Article 35(2) with regard to novelty, inventive step or industrial applicability; citations and explanations supporting such statement
<input type="checkbox"/> Box No. VI	Certain documents cited
<input type="checkbox"/> Box No. VII	Certain defects in the international application
<input checked="" type="checkbox"/> Box No. VIII	Certain observations on the international application

Date of submission of the demand 19-10-2005	Date of completion of this report 17-02-2006
Name and mailing address of the IPEA/SE Patent- och registreringsverket Box 5055 S-102 42 STOCKHOLM	Authorized officer Roland Landström/MN
Facsimile No. +46 8 667 72 88	Telephone No. +46 8 782 25 00

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International application No.

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Supplemental Box

In case the space in any of the preceding boxes is not sufficient.

Continuation of: Cover sheet

INTERNATIONAL PATENT CLASSIFICATION (IPC) :

H04M 1/23 (2006.01)

H01H 25/00 (2006.01)

INTERNATIONAL PRELIMINARY REPORT ON PATENTABILITY

International application No.

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Box No. I Basis of the report

1. With regard to the **language**, this report is based on:

- ☒ the international application in the language in which it was filed
- ☐ a translation of the international application into _____, which is the language of a translation furnished for the purposes of:
- ☐ international search (Rules 12.3(a) and 23.1(b))
- ☐ publication of the international application (Rule 12.4(a))
- ☐ international preliminary examination (Rules 55.2(a) and/or 55.3(a))

2. With regard to the **elements** of the international application, this report is based on *(replacement sheets which have been furnished to the receiving Office in response to an invitation under Article 14 are referred to in this report as "originally filed" and are not annexed to this report)*:

- ☐ the international application as originally filed/furnished
- ☒ the description:
- pages 1 - 10 as originally filed/furnished
- pages* _____ received by this Authority on _____
- pages* _____ received by this Authority on _____
- ☒ the claims:
- pages _____ as originally filed/furnished
- pages* _____ as amended (together with any statement) under Article 19
- pages* 1 - 3 received by this Authority on 19-10-2005
- pages* _____ received by this Authority on _____
- ☒ the drawings:
- pages 1 - 4 as originally filed/furnished
- pages* _____ received by this Authority on _____
- pages* _____ received by this Authority on _____
- ☐ a sequence listing and/or any related table(s) – see Supplemental Box Relating to Sequence Listing.

3. ☐ The amendments have resulted in the cancellation of:

- ☐ the description, pages _____
- ☐ the claims, Nos. _____
- ☐ the drawings, sheets/figs _____
- ☐ the sequence listing (*specify*): _____
- ☐ any table(s) related to the sequence listing (*specify*): _____

4. ☐ This report has been established as if (some of) the amendments annexed to this report and listed below had not been made, since they have been considered to go beyond the disclosure as filed, as indicated in the Supplemental Box (Rule 70.2(c)).

- ☐ the description, pages _____
- ☐ the claims, Nos. _____
- ☐ the drawings, sheets/figs _____
- ☐ the sequence listing (*specify*): _____
- ☐ any table(s) related to the sequence listing (*specify*): _____

* If item 4 applies, some or all of those sheets may be marked "superseded."

INTERNATIONAL PRELIMINARY REPORT ON PATENTABILITY

International application No.

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Box No. V Reasoned statement under Article 35(2) with regard to novelty, inventive step or industrial applicability; citations and explanations supporting such statement

1. Statement

Novelty (N)	Claims	<u>7 - 11, 13 - 17</u>	YES
	Claims	<u>1 - 6, 12, 18</u>	NO
Inventive step (IS)	Claims		YES
	Claims	<u>1 - 18</u>	NO
Industrial applicability (IA)	Claims	<u>1 - 18</u>	YES
	Claims		NO

2. Citations and explanations (Rule 70.7)

The purpose of the invention is unclear.

Reference is made to the following documents:

D1: US 6441753 B1
D2: US 20030018397 A1
D3: WO 0034965 A
D4: US 20020190727 A1
D5: US 4566001 A
D6: GB 2054268 A

Document D1 (figure 12, abstract) shows dome switches arranged essentially at the periphery of a circle.

Document D2 (figure 2, abstract) shows dome switches arranged essentially at the periphery of a circle.

Document D3 (page 39, line 12 - page 40, line 17, figures 134 - 138) shows an input apparatus for, for example, a mobile telephone. The input apparatus has an annular shaped rotator wheel (422), means (441, 442, 445, 446) for detecting the rotational movement of the rotator wheel (422), and select means (micro-switches 450 - 453) activated when pressure (push-down points 427 - 430) is applied to the upper surface of the rotator wheel (422).

Document D4 (abstract, figures 1 - 31) discloses an input apparatus with a capacitive type sensor.

Document D5 (column 2, lines 15 - 37, figures 1 - 3) discloses an input apparatus with means (20, 22), including a flexible conducting strip (20) and a resistive substrate (22) which can be locally brought together by pressing the strip (20), for detecting the movement (position) of a finger.

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Supplemental Box

In case the space in any of the preceding boxes is not sufficient.

Continuation of: BOX V

Document D6 (page 1, lines 28 - 123, figure 1) shows a dome switch having an annular dome (3).

The invention claimed in amended claims 1 - 6, 12 and 18 is at least essentially known from document D1, D2 or D6. Therefore, the invention claimed in claims 1 - 6, 12 and 18 lacks novelty and inventive step. Claims 1 - 6, 12 and 18 fulfil the requirement of industrial applicability.

It would be obvious to a person skilled in the art to replace the peripheral domes of the switches of documents D1 and D2 with a single annular shell when more switches are needed.

The invention claimed in claims 7 - 11 differs from what is known from document D3 essentially in that the annular rotator wheel operates a dome switch.

The technical problem is how to select the switches.

However, dome switches and their advantages are well known, see for example document D1, D2 or D6. Therefore, it would be obvious to a person skilled in the art to choose these switches in the input apparatus of document D3 and thus arrive at an input apparatus/dome switch having all the essential features of claims 7 - 11. Furthermore, no unexpected technical effect is obtained. Therefore, the invention claimed in claims 7 - 11 is novel but lacks an inventive step. Claims 7 - 11 fulfil the requirement of industrial applicability.

The invention claimed in claims 13 - 14 differs from what is known from document D3 essentially in that the input apparatus is used for a multimedia device.

The technical problem is how to find a new use.

However, it is obvious to a person skilled in the art that the input apparatus of document D3 can be used for a multimedia device.

Therefore, it would be obvious to a person skilled in the art to use the input apparatus/mobile telephone of document D3 for a multimedia device, for example a mobile television telephone, and thus arrive at an input apparatus having all the essential features of claims 13 - 14.

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Continuation of: Box V

Furthermore, no unexpected technical effect is obtained. Therefore, the invention claimed in claims 13 - 14 is novel but lacks an inventive step. Claims 13 - 14 fulfil the requirement of industrial applicability.

The invention claimed in claims 15 - 16 differs from what is known from document D3 essentially in that the input apparatus is used for a multimedia device and that the means to detect rotational movement comprises conductive tracks and a bridge contact that rotates in conjunction with the wheel.

The technical problem is how to find a new use and an alternative means to detect rotational movement. However, all the means required to detect rotational movement (compare with the description, page 5, line 20 - page 6, line 16) are not revealed in claims 15 - 16.

However, it is obvious to a person skilled in the art that the input apparatus of document D3 can be used for a multimedia device. It is also well known to detect rotational movement by using conductive tracks and a bridge contact. Compare with potentiometers and document D5. No unexpected technical effect is obtained by replacing the optical means used according to document D3 with the conductive tracks and a bridge contact that rotates in conjunction with the wheel.

Therefore, it would be obvious to a person skilled in the art to provide the input apparatus of document D3 with conductive tracks and a bridge contact that rotates in conjunction with the wheel for detecting rotational movement and use the input apparatus of document D3 for a multimedia device, thus arriving at an input apparatus having all the essential features of claims 15 - 16. Therefore, the invention claimed in claims 15 - 16 is novel but lacks an inventive step. Claims 15 - 16 fulfil the requirement of industrial applicability.

It would also be obvious to a person skilled in the art to modify the input apparatus of document D3 so that the tactile response of the select means is substantially the same over all of the rotator wheel, especially considering the advantages can readily be contemplated in advance. Therefore, the invention claimed in claim 17 is novel but lacks an inventive step. Claim 17 fulfils the requirement of industrial applicability.

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Supplemental Box

In case the space in any of the preceding boxes is not sufficient.

Continuation of: BOX V

To sum up, the invention claimed in claims 1 - 6, 12 and 18 lacks novelty and inventive step and the invention claimed in claims 7 - 11 and 13 - 17 is novel but lacks an inventive step. All the claims fulfil the requirement of industrial applicability.

Box No. VIII Certain observations on the international application

The following observations on the clarity of the claims, description, and drawings or on the question whether the claims are fully supported by the description, are made:

The construction and function of the dome switch are not clearly defined in claim 1. The shape of the switch is not clearly defined in claim 1, especially since the word "dome" and the vague expression "a shape extending at least substantially along a length of an annular shaped path, wherein the path is circular in shape" are contradictory. Therefore, claim 1 does not meet the requirements of Article 6 PCT (The claim or claims shall define the matter for which protection is sought. Claims shall be clear and concise).

Claim 14 repeats the contents of claim 13.

Claims 15 and 16 do not reveal the principle, the construction and the function of the means to detect rotational movement. Therefore, claims 15 - 16 do not contain all the features that are essential to the definition of the invention. Consequently claims 15 and 16 do not meet the requirement following from Article 6 PCT taken in combination with Rule 6.3(b) PCT that a claim must contain all the technical features essential to the definition of the invention.

Claim 17 is unclear since it does not reveal what kind of tactile response is intended to be substantially the same and the means required for obtaining substantially the same tactile response.

In the apparatus claim 18, which refers to any preceding claim (i.e. apparatus claims 12 - 17), the expression "the dome switch" uses the definite article although claims 13 - 17 do not mention a dome switch.

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Claims

1. A dome switch having a shape extending at least substantially along a length of an annular shaped path, wherein the path is circular in shape.
2. A dome switch as claimed in claim 1, wherein said dome switch surrounds at least one other dome switch.
3. A dome switch as claimed in claim 1 or 2, wherein said dome switch comprises a partial annulus.
4. A dome switch as claimed in claim 1 or 2, wherein said dome switch comprises a complete annulus.
5. A dome switch as claimed in any preceding claim, wherein the shape of the dome switch is defined by the shape of the dome sheet.
6. A dome switch as claimed in any of preceding claim, wherein a select means is activated upon actuation of the dome switch.
7. A dome switch as claimed in any preceding claim, wherein a rotator wheel is mounted on said dome switch.
8. A dome switch as claimed in any claim 7, wherein the dome switch is actuated when a pressure is applied to an upper surface of the rotator wheel in a direction substantially parallel to an axis perpendicular to the upper planar surface of the rotator wheel.
9. A dome switch as claimed in claim 7 or 8, wherein the upper planar surface of the rotator wheel is substantially annular in shape.

AMENDED SHEET

10. A dome switch as claimed in claim 7, 8 or 9, , wherein the upper planar surface of the rotator wheel is exposed such that the upper planar surface may be accessed by a user.
11. A dome switch as claimed in any one of claims 9 to 10, wherein the rotator wheel is connected to monitoring means for detecting rotational movement of the rotator wheel about an axis perpendicular to the upper planar surface of the rotator wheel.
12. An input apparatus comprising a dome switch as claimed in any preceding claim.
13. An input apparatus for a multimedia device, said input apparatus comprising:
- a rotator wheel having an upper planar surface that is substantially annular in shape and exposed in order that the upper planar surface may be accessed by a user of the multimedia device;
 - means for detecting rotational movement of the rotator wheel about an axis perpendicular to the upper planar surface of the rotator wheel; and
 - select means activated when a pressure is applied to the upper surface of the rotator wheel in a direction substantially parallel to an axis perpendicular to the upper planar surface of the rotator wheel.
14. An input apparatus as claimed in claim 13, further comprising means to detect rotational movement of the rotator wheel.
15. An input apparatus as claimed in claim 14, wherein the means to detect rotational movement comprises conductive tracks.
16. An input apparatus as claimed in any one of claims 13 to 15 in which a bridge contact is arranged to rotate in conjunction with the wheel.

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17. An input apparatus as claimed in any claims 13 to 16, wherein a tactile response of the select means is substantially the same over all of the rotator wheel.

18. An input apparatus as claimed in any preceding claim, wherein activation of the dome switch comprises temporarily modifying the electrically conductive or electrically capacitive properties of an electronic element.